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Introduction

This report compares farrow to finish pork production efficiency measures by examining record results from the Iowa Swine Business Record Program for the years 1980 through 1998. The analysis provides a year by year comparison between the top and low profit producers. The Iowa Swine Business Record Program is a record-keeping program sponsored by the Iowa State Cooperative Extension Service that tracks financial and production data for participating producers. Results are reported annually with information for the average, top one-third and low one-third reported for farrow-to-finish producers. The categorization is established through use of margin over all costs per cwt. (hundredweight) of pork produced. The top one-third producers were the operations that had the highest margin over all costs per hundredweight of pork produced. Similarly, the low one-third were the producers which had the lowest margin per hundredweight. The top and low one-third producers were calculated annually and thus producers may change categories from year to year.

Results

The average annual difference in net profit and return to management between the top one-third and low one-third producers was substantial, with an average annual difference of $46,175 (Table 1). The top one-third producers averaged $41,983 while the average for the low one-third was a loss of $4,192 annually. Over time, this difference has widened from an average difference of $33,358 during the 1980 – 1989 period to $60,416 in the 1990 – 1998 period. One reason why net profit and return to management differences have grown over the years is the growth of the operation size. Average sow herd size has shown a rapid increase since 1995 (Table 2). However, this is not a major reason for the expanding difference during the 1990's. The top one-third had on average 13 (10%) more sows than the low one-third. While they were larger they were not drastically larger.

The difference in returns between the top and low third producer can be partially attributed to the size of the operations but a bigger factor is pig productivity. The average sow herd size was within nine sows over the 1980 – 1998 time period. However, the difference in market hogs sold was about 300 more pigs per year (Table 2) due to production differences that will be discussed later. Table 3 provides information on the margin per market hog sold. It shows there was a $29.98 per head margin difference from the top one-third vs. the bottom one-third producers. This difference has remained relatively stable during the 1980's and the 1990's. This difference comes from a combination of improved production efficiencies, prices, and cost control that are examined below.

The scale could either increase the difference or decrease the difference in net profit and return to management for the operations in any given year by adding or subtracting from the total hogs that are being sold. While the more efficient farms were larger, they had only about 10% more sows. This suggests that scale is not the primary factor in determining differences in production costs for the participants in the Iowa Swine Record System. However, with this conclusion it should be noted that the range of producers in this record system is limited to those who participate in the record system and does not include "mega sized" producers.

One factor in the difference in margins was the difference in market price received per hundredweight of market hogs sold. Over the nineteen year period, the average selling price was $47.31 per hundredweight for the top one-third compared to $46.42 for the low one-third, a difference of $.89/cwt. This represents a difference of $2.30 per pig, an increase of about five- percent. While this may not appear to be a big difference, it adds up over time.

Differences between total production costs for the top and low one-third are shown in Table 4. Production costs per hundred pounds pork produced were substantially lower for the top one-third. The average cost of production per hundredweight over the 19-year period was $37.57 and $48.05 for the top and low one-third, respectively. This is a cost difference of $10.48 per cwt., which would be approximately $25 per head. Table 4 also shows that total cost and total cost differences have trended downward during the mid to late 1990's. The difference in total costs between the top and low one-third went from $10.62 in the 1980 - 1989 period to $10.34 in the 1990 – 1998 period. During the 1994-1998 time period the cost difference was $9.75 per cwt.; $.87 under the level of the 1980s. With the differences in market price and total cost decreasing from

the 1980 – 1989 period to the 1990 – 1998 period, this suggests that differences in productivity such as pigs per sow have increased.

Total feed cost represented about 61% of the total production costs over the time period (Table 6). The top one-third had feed cost, which were $4.41 lower per hundred pounds of pork produced. This difference in feed cost was responsible for 42% of the total production cost difference. The feed cost difference is due to both production efficiency differences as well as a price difference in the diets fed.

During this time period, the lower one-third producers required an average of 40 (11%) more pounds of feed to produce 100 pounds of pork. The lower one-third also reported paying $.43 (6.4%) more per hundred pounds of feed fed (Table 5). The difference in diet costs may reflect price differences in regions within the state, superior ingredient purchasing agreements, better least cost ration formulation, as well as cost differences between raised and purchased ingredients. While these are all reasons for the difference they could not be sorted out with the information available.

The lower return group had a death loss (weaning to finish) that was 1.65 percentage points (30%) higher than the top one-third over the 19-year period (Table 5). The death loss for both groups of operators has increased in recent years; approximately 0.75 percentage points for each group. This may be in part due to such issues as earlier weaning ages. This percentage not only affects the revenues that are received, but it also decreases the number of pigs that fixed costs and sow-related costs can be spread over and affects efficiency numbers such as feed efficiency. Changes in pigs weaned per sow per year can affect the distribution of fixed costs as well. The lower one-third weaned 1.79 fewer pigs per sow per year during the 19-year period. This represents a major reason for the widening gap between sow herd size and the number of market hogs sold between the two groups. Pigs weaned per sow have increased over time for both groups. Given the increased death loss it means that the number of pigs born per sow has increased even more over time.

Another factor in the distribution of fixed costs and sow expenditures is the market weight per pig (Table 5). The average difference between the two systems is only one pound per market hog sold. Market weight and pigs sold per sow are the main factors in determining the market hog weight sold per sow. The difference between the two groups has averaged 368 pounds in favor of the top one-third and has increased from 280 to 465 pounds from the 1980 – 1989 period to the 1990 – 1998 period (Table 5). During the 1990-1998 period, the top one-third produced 15 percent more pork per sow than did the lower one-third.

There was a steady rise in the average market hog weight. It has increased from 224 pounds in 1980 to the 250-255 range by the late 1990s, an increase of approximately 30 pounds or 13%. For the top one-third, pounds of market hog produced per sow increased from 2436 pounds in 1980 to 3798 pounds in 1998, a 56 percent increase over the 19-year period. The low one-third group increased by a similar percentage.

Other operating costs, which include utilities, veterinary expenses, and other miscellaneous expenses, are shown in Table 6. These costs represent 12% of the total cost of production. The lower one-third spent an extra $1.87 per hundred pounds of pork produced. This difference represents 18% of the difference in total production cost. This may be due to a difference in utility expenses, bedding for alternative systems, etc, and may also imply higher veterinary expenses. This conclusion is supported in part by the increased death loss shown above. If this is the case, animal health and disease are having a large impact on which producers are located in the lower one-third each year. Disease problems can impact production efficiencies leading to increased costs. Operating costs have slowly become increasingly more important in determining the difference between the top one-third and low one-third.

Table 6 provides information on the fixed and labor portion of pig production costs. Fixed costs represented the second largest cost difference between the two groups, with the top one-third profit producers fixed costs averaging $2.78 per hundred pounds of pork produced below the low one-third. This represented 27 percent of the total cost difference despite representing only 16 percent of the total production costs. This points out the need for efficient facility utilization. Differences in fixed costs have trended lower over time as the fixed costs for both groups have been decreasing. The fixed cost differences could be a result of many factors such as age of facilities, depreciation method, degree of facility utilization, and facility type. Labor costs were 10% of total production costs. The higher profit group spent an average of $1.39 per cwt. less per year for labor, which is 13% of the total cost difference.

Summary

Profitability, production costs, and production efficiency can vary considerably between swine producers. By examining the top one-third and low one-third profit groups, useful information can be obtained on differences between the two groups of producers. This can provide some general information for potential production adjustments. This report has shown that there was a large difference in net profit between producers and that the top one-third is considerably more efficient in terms of production and cost control.

This report shows that the differences in net profit and return to management during the 1980-1998 time period are due to multiple causes. In general, the top one-third group was doing a number of things better than the low one-third-profit group. They had lower production costs, better feed efficiency, lower death loss, more pigs per sow per year, etc. While some of the differences were not large, the differences in profitability were significant when all factors are combined. While the difference in size was not substantial; the top one third had about 10 percent more

sows, the difference in profit was dramatic. Net profit and return to management averaged $41,983 for the top one-third and a -$4,892 for the low one-third during the 1980-1998 time period.

The largest cost difference was feed costs. Differences in feed costs accounted for 42 percent of the cost of production differences. Fixed costs represented 27 percent of the difference, while operating costs and labor costs represented 18 and 13 percent of the difference, respectively. While feed costs and feed efficiencies are clearly most important, the importance of fixed costs and facility use should not be overlooked. Fixed costs represented 16 percent of the total production costs but they explained 27 percent of the production cost difference between the top and low one-third producers. Similarly feed costs represented 61 percent of total production costs and explained 42 percent of the production cost difference.

Additional information on factors such as facility type, facility age, and whether issues such as disease pressure has altered the group that a producer is in during a given year would help to explain more of what is happening within and between the groups. One item that this report clearly points out is that understanding and implementing cost control, production efficiency, and effective purchasing and marketing are essential in the management of a swine operation.

Table 1. Net Profit and Return to Management
For Iowa Swine Business Record Farrow to Finish Producers.

Year	Operations	Iowa Top 1/3	Iowa Low 1/3	Difference
1980	69	$12,407	$27,353	-$14,946
1981	87	$4,724	-$3,276	$8,000
1982	147	$75,230	$17,506	$57,724
1983	187	$11,730	-$32,138	$43,868
1984	202	$39,019	-$15,710	$54,729
1985	273	$47,201	$11,875	$35,326
1986	310	$88,406	$49,331	$39,075
1987	324	$63,746	$24,994	$38,752
1988	295	$20,010	-$10,348	$30,358
1989	318	$34,821	-$5,879	$40,700
1990	338	$88,029	$24,199	$63,830
1991	353	$40,094	-$6,833	$46,927
1992	336	$33,547	-$7,277	$40,824
1993	267	$45,803	-$4,638	$50,441
1994	221	$328	-$35,779	$36,107
1995	180	$70,798	-$392	$71,190
1996	98	$92,912	$11,897	$81,015
1997	102	$64,328	-$27,072	$91,400
1998	85	-$35,454	-$97,469	$62,015
Average	221	$41,983	-$4,192	$46,175
1980 - 1989	221	$39,729	$6,371	$33,358
1990 - 1998	220	$44,487	-$15,929	$60,416

Table 2. Size of Operations
For Iowa Swine Business Record Farrow to Finish Producers.

	Average Sow Herd Size, No. of Head		Number Market Hogs Sold	
Year	Iowa Top One-Third	Iowa Low One-Third	Iowa Top One-Third	Iowa Law One-Third
1980	122	141	1327	1301
1981	108	112	1327	1149
1982	123	102	1430	1077
1983	114	94	1373	1058
1984	132	92	1718	1066
1985	100	104	1325	1312
1986	103	102	1272	1249
1987	107	109	1398	1251
1988	101	95	1317	1158
1989	111	113	1529	1359
1990	123	98	1707	1150
1991	113	110	1563	1426
1992	109	104	1574	1311
1993	122	114	1781	1265
1994	122	118	1783	1701
1995	131	108	1982	1391
1996	161	135	2350	1770
1997	158	150	2184	1747
1998	177	166	2626	2149
Average	123	114	1661	1362
1980 - 1989	112	106	1401	1198
1990 - 1998	135	122	1950	1545

Table 3. Margin Over All Costs Per Head			
For Iowa Swine Business Record Farrow to Finish Producers.			
Year	Iowa Top 1/3	Iowa Low 1/3	Difference
1980	$8.56	-$23.78	$32.34
1981	$5.74	-$31.09	$36.83
1982	$47.39	$11.90	$35.49
1983	$20.45	-$12.89	$33.34
1984	$0.28	-$23.50	$23.78
1985	$20.30	-$11.32	$31.62
1986	$53.20	$18.62	$34.58
1987	$42.41	$17.07	$25.34
1988	$14.62	-$9.89	$24.51
1989	$22.26	-$5.63	$27.89
1990	$48.77	$18.90	$29.87
1991	$23.04	-$7.49	$30.53
1992	$20.71	-$8.56	$29.27
1993	$23.41	-$3.93	$27.34
1994	$0.17	-$28.66	$28.83
1995	$22.46	-$0.80	$23.26
1996	$28.46	$6.32	$22.14
1997	$25.76	-$14.98	$40.74
1998	-$12.58	-$44.59	$32.01
Average	$21.86	-$8.12	$29.98
1980 - 1989	$23.52	-$7.05	$30.57
1990 - 1998	$20.02	-$9.31	$29.33

Table 4. Total Cost Per Hundredweight of Pork Produced

For Iowa Swine Business Record Farrow to Finish Producers.

Year	Iowa Top 1/3	Iowa Low 1/3	Difference
1980	$39.28	$49.87	-$10.59
1981	$42.04	$55.54	-$13.50
1982	$41.39	$52.60	-$11.21
1983	$42.97	$54.11	-$11.14
1984	$42.37	$53.24	-$10.87
1985	$35.64	$45.93	-$10.29
1986	$33.65	$43.02	-$9.37
1987	$31.50	$41.03	-$9.53
1988	$36.28	$45.76	-$9.48
1989	$37.01	$47.15	-$10.14
1990	$35.90	$47.56	-$11.66
1991	$35.49	$46.79	-$11.30
1992	$34.54	$45.73	-$11.19
1993	$36.10	$46.25	-$10.15
1994	$36.05	$46.02	-$9.97
1995	$36.07	$45.17	-$9.10
1996	$44.03	$54.47	-$10.44
1997	$40.34	$51.12	-$10.78
1998	$33.21	$41.66	-$8.45
Average	$37.57	$48.05	-$10.48
1980 - 1989	$38.21	$48.83	-$10.62
1990 - 1998	$36.86	$47.20	-$10.34

Table 5. Comparison of Top and Low Return Farrow to Finish (1980-1998)

For Iowa Swine Business Record Farrow to Finish Producers.

	Iowa Top 1/3	Iowa Low 1/3	Difference
Net Profit and Return to Management	$41,983	-$4,192	$46,175
Feed Efficiency (per CWT gain)	359	399	-40
Cost of Diet Per Cwt. Of Feed	$6.75	$7.18	-$0.43
Pig Death Loss, Weaning to Market	5.62%	7.26%	-1.65%
Pigs Weaned Per Sow Per Year	15.77	13.98	1.79
Market Weight	239	238	1
Market Weight Sold Per Sow	3220	2852	368

Table 6. Differences in Costs Per Hundredweight by Category (1980-1998)

For Iowa Swine Business Record Farrow to Finish Producers.

	Iowa Top 1/3	Iowa Low 1/3	Difference	Percent of Total Cost Difference	Percent of Total Costs
Feed Costs	$24.09	$28.50	-$4.41	42 %	61%
Other Operating Costs	$4.29	$6.16	-$1.87	18%	12%
Fixed Costs *	$5.56	$8.34	-$2.78	27%	16%
Labor Costs **	$3.71	$5.10	-$1.39	13%	10%
Total	$37.57	$48.05	-$10.48	100%	100%